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Practical and Theoretical Mechanics and Chemistry.

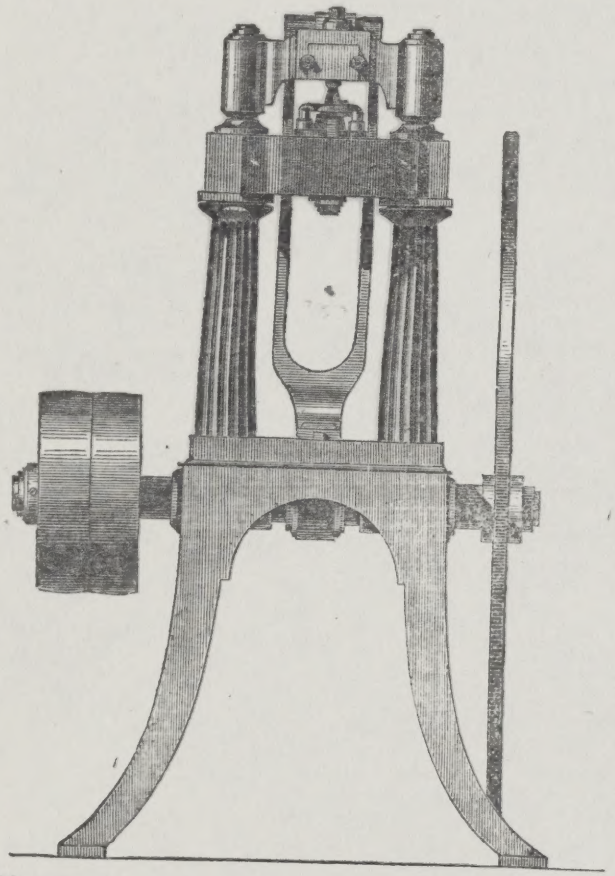
Description of Presses for cutting out Blanks, or Planchets, for Coin, made for the Branch Mints at Charlotte and Dahlonega, from designs by, and under the direction of, FRANKLIN PEALE, *of the Mint of the United States.*

It is always desirable in the construction of machines, that there should be no redundancy of parts, and that they be made as simple as is consistent with efficiency of operation. It is also equally desirable to distribute the requisite parts in as symmetrical a form as the object of their construction will permit, not forgetting that the laws of good taste are as applicable to machinery as to architecture, or to any other form in which inorganic matter may be presented to the eye. It was under the influence of these sentiments that the machine which is the subject of this notice was designed.

The preparatory operations of coining are briefly stated for the information of the general reader. The ingots of standard metal, after being rolled to the desired thickness, nearly, are taken to the *draw-bench*, and by its operation are equalized in thickness throughout. They then pass to the *cutting-out press*, a few pieces are cut from the end of each *slip*, (the rolled and drawn ingot thus called,) and weighed, to test their accuracy, and if satisfactory in this respect, the whole *slip* is passed under the operation of the cutting-out press, the operator being assured that the several pieces cut out of the slip are of the same weight, or so nearly approximated to it, as to be within the *allowance* for error of workmanship provided by the Mint law.

A square table of cast-iron supports a shaft, upon one end of which is the usually formed fast and loose pullies to receive motion from the propelling power by a band. On the opposite end is a fly wheel, also of cast-iron. In the centre of this shaft, between the two journals on which it turns, is an eccentric, formed within the diameter of the shaft, and connected with the *bridle* (to be noticed hereafter,) by a *stub-end* and *strap*, constructed in the usual manner.

Front view of the Cutting-out Press.



The table supports also two columns, upon which rests a kind of architrave, forming a seat for the die, to which the latter is secured by two hooks with screws and nuts. Above each column is a circular guide rod, for the *cross head*, which is made of bell metal. In the centre of the cross head is the bed for the punch, with a *follower* closing upon it, and secured by two screws. Over the *cross head* passes the *bridle*, which is constructed of iron in one piece, and is secured to the cross head by a cap. By means of this *bridle* the motion of the eccentric, (which does not exceed three-eighths of an inch,) is communicated to the cross head and punch; the latter descending into the bed a short distance, when the eccentric is at its lowest point.

To the bed of the die is attached a *stripper*, *guide*, and *stop*. The first serves to draw the strip off the punch, when the latter rises; the second to guide the strip laterally; and the last to determine the distance to which the strip is pushed forward, so as to ensure regularity, and of course economy, in cutting out the greatest number of pieces that the strip is capable of yielding.

Cutting out presses on this principle are rapid and efficient in their operation; they will cut out 160 pieces, or more, per minute, and are not subject to derangement; and finally require very little power to move them, the momentum of the fly being sufficient to pierce the slip when running at the rate mentioned above.

These cutting-out presses were made by Messrs. Merrick and Agnew of this city, and we have great pleasure in stating that in exactness of execution, beauty of finish, and general style of workmanship, they are satisfactory in the highest degree. In these respects they are not surpassed by any machines of foreign or domestic execution. The presses, milling machines, and some other of the apparatus for the Branch Mints, have been executed by the above firm, to all of which these remarks are equally applicable.

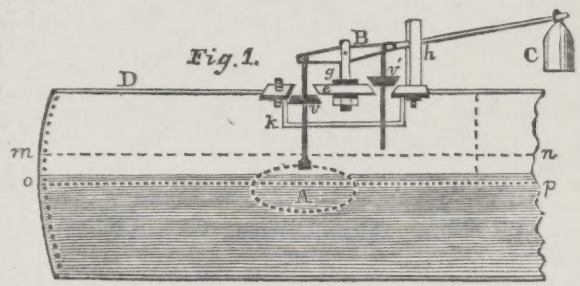
It is proper here to mention, that when the first press was constructed, Mr. Rufus Tyler was a member of the firm, and had the superintendence of this part of the work.

Mr. Samuel Raub's Safety Apparatus for Steam Boilers.

(Communicated for this Journal by Prof. W. R. Johnson.)

This igenious, but simple and efficient plan for indicating the deficiency of water in a steam boiler, is presented in the accompanying sketch, (fig. 1.)

Fig. 1.



D is a vertical section through the length of a cylindrical steam boiler, without an interior flue; *m n* is the ordinary water line, and *o p* is the fire line of the same boiler. On the top of the cylinder is riveted a plate of brass *e*, serving for valve seats, and through the centre of this plate passes the upright iron pillar *g*, with a fork at top to receive and support, on an axis, the lever B. On opposite sides of the axis, and at equal distances from it, are attached to the lever the rods of the two equal valves *v* and *v'* the former of which opens inwards, and the latter outwards, so that any pressure of steam within the boiler which tends to open the one, tends by an equal force to close the other; but any force which is applied to either arm of the lever, tends to affect both valves in the same manner. *h* is a simple guide rod, in the slit of which the lever plays, and *k* a guide for the valve rods on the inside of the boiler. A is a solid, or hollow, metallic body,